Amendments to the Claims

1 (currently amended). A supermolecular structure ~~comprised~~ comprising: [[of]]

a host material; and

impurities comprising component atoms of at least a first type and a second type such that the positions of the component atoms are substantially fixed, at least in part by controlled placement on a surface, to impart substantially predictable single-charge properties to the structure, the structure also being described by the formula:

$H_A \Sigma X_{ia}$

wherein:

H defines the host material;

A is a number representing the number of host atoms in the structure;

X defines the i^{th} impurity; and

a defines the quantity of the i^{th} impurity.

2 (original). A pn junction formed from the supermolecular structure of claim 1.

3 (original). The pn junction of claim 2 further comprising:

an insulating substrate on which the supermolecular structure is disposed; and

contact electrodes connected to the supermolecular structure so that the pn junction forms a stand-alone device.

4 (original). A bipolar cell formed from the supermolecular structure of claim 1.

5 (original). The bipolar cell of claim 4 further comprising:

an insulating substrate on which the supermolecular structure is disposed; and

contact electrodes connected to the supermolecular structure so that the bipolar cell forms a stand-alone device.

6 (currently amended). A single charge oscillator array comprising a plurality of electrostatically coupled supermolecular structures, each structure further comprising:

a host material; and

impurities comprising component atoms of at least a first type and a second type such that the positions of component atoms are substantially fixed, at least in part by controlled placement on a surface, to impart substantially predictable properties to the structure, each structure also being described by the formula:

$H_A\Sigma X_{ia}$

wherein:

H defines the host material;

A is a number representing the number of host atoms in the structure;

X defines the i^{th} impurity; and

a defines the quantity of the i^{th} impurity.

7-15 (canceled).

16 (currently amended). A semiconductor oscillator comprising:

an insulating substrate;

a single charge oscillator array disposed upon the insulating substrate, the single charge oscillator array further comprising a plurality of electrostatically coupled host structures comprising single-charge impurity atoms of at least a first type and a second type, each single-charge impurity atom have been positioned at least in part by controlled placement on a surface;

contact electrodes connected to the array; and

a thermal energy supply system for maintaining an operating temperature of the array at least as high as a threshold temperature.

17 (currently amended). The semiconductor oscillator of claim 16 wherein ~~the single-charge oscillator array further comprises a plurality of electrostatically coupled supermolecular structures,~~ each host structure ~~further comprising a host material and impurities such that the positions of component atoms are substantially fixed to impart substantially predictable properties to the structure, each structure also being~~ can be described by the formula:

$H_A\Sigma X_{ia}$

wherein:

H defines the host material;

A is a number representing the number of host atoms in the structure;

X defines the i^{th} impurity; and

18 (currently amended). The semiconductor oscillator of claim 16 wherein ~~the single-charge oscillator array further comprises a plurality of electrostatically coupled, single-dopant bipolar cells, each cell comprises~~ the single-charge impurity atoms further comprise:

~~a host structure;~~

a pair of atoms of [[a]] the first type disposed so that a single atom of the pair resides at each of two opposing sides of the host structure; and

a single atom of [[a]] the second type disposed between the atoms of the first type within the host structure so that two asymmetrical potential wells, separated by a barrier, are formed within the host structure.

19 (currently amended). Apparatus for supplying oscillations comprising:

means for supplying thermal energy to maintain an operating temperature of the apparatus at least as high as a threshold temperature;

means for generating coherent oscillations in response to the thermal energy, the means for generating further comprising a plurality of electrostatically coupled host structures comprising single-charge impurity atoms of at least a first

type and a second type, each single charge impurity atom have been positioned at least in part by controlled placement on a surface;

means for insulating and supporting the means for generating; and

means for connecting the apparatus to external circuitry, the means for connecting connected to the means for generating.

20-28 (canceled).